

ABSTRACT OF THE DISCLOSURE

Techniques to bond two or more smaller bodies or subunits to produce a unitary SiC composite structure extend the capabilities of reaction-bonded silicon carbide, for example, by making possible the fabrication of complex shapes. In a first aspect of the present invention, two or more preforms are bonded together with a binder material that imparts at least strength sufficient for handling during subsequent thermal processing. In a second aspect of the present invention, instead of providing the subunits to be bonded in the form of preforms, the subunits may be dense, SiC composite bodies, e.g., RBSC bodies. In each of the above embodiments, a preferable means for bonding two or more subunits combines aspects of adhesive and mechanical locking characteristics. One way to accomplish this objective is to incorporate a mechanical locking feature to the joining means, e.g., a "keyway" feature. The mechanical locking feature thus substitutes for, or supplements the binder qualities of the adhesive, which is especially important when the adhesive itself may be or become weak due to, for example, thermal processing.